

Narrative in Virtual Reality? Anatomy of a Dream Reborn

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Abstract

When the big leap forward of computer technology took place for the general public in the 80s and 90s, virtual reality technology (VR) was touted as the “next big thing” that digital media would bring into our lives. Janet Murray’s influential book *Hamlet on the Holodeck* (1997) explored the possibility of turning narrative into the “immersive, interactive experience generated by a computer” that defines VR. But VR did not live up to its expectations, and after the year 2000, it faded from the radar of popular interest. It regained attention around 2011 when Mark Zuckerberg, the founder/CEO of Facebook, bought Oculus Rift, the maker of a relatively cheap and lightweight head-mounted display. Currently available VR narratives are distinguished from other digital narratives through three-dimensional images, interactive panoramic representations, and the ability to manipulate our experience of our own body. In this article I discuss three projects that use some of these resources in order to assess the storytelling potential of the medium: *Clouds Over Sidra*, a documentary about a camp for Syrian refugees in Jordan; *Hard World for Small Things*, a fictionalized version of the shooting of an unarmed black man by white policemen; and *VRwandlung*, a project that puts

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the user in the situation of the hero of Franz Kafka's *The Metamorphosis*, who wakes up one day to discover that he has been transformed into a giant insect. Basing my judgment of this limited corpus, I assess the potential of VR narrative with respect to four kinds of immersion: ludic, spatial, temporal and emotional.

Keywords

Virtual reality, narrative, interactivity, immersion, panoramic representation, experience of embodiment

When the great leap forward of computer technology reached the general public in the 80s and 90s, there was a pervasive sense that we were witnessing the birth of a new medium of representation, a medium that would make as significant a difference for art and entertainment as the great inventions of the past, such as writing, film, and television. One of the forms that this new medium was expected to take was Virtual Reality (VR), a technology which was promoted at the time as the “next big thing” that the computer would bring into our lives. VR was conceived by its advocates as an “immersive, interactive experience generated by a computer” (Pimentel & Texeira 1993: 11), and the key notion was that of presence. Participants would experience an image created by a computer as if it were “the real thing”, this is to say, as if it were a material reality. They would be able to modify the simulated environment through gestures of their own body, or perhaps even through voice command. The notion of presence means that the computer should disappear from active consciousness and be replaced by the object of the simulation.

VR: the first wave of publicity

In 1997, Janet Murray’s popular book *Hamlet on the Holodeck* explored the possibility of turning narrative into the kind of experience that defines VR. The Holodeck is a fictional technology from the TV series *Star Trek*. It consists of an empty cube on which a computer projects a three-dimensional world simulation. The user steps into this world and interacts with synthetic characters operated by artificial intelligence. No matter what the user says or does, the system responds coherently and integrates the user’s input into a narrative arc that sustains interest. The user thus becomes a character and experiences the narrative from a first person perspective.

If the Holodeck represents a valid model for digital narrative, this means that the computer does not have to rely on a fixed story, as do most comput-

er games. A coherent plot must emerge from the live interaction between the human participant and the computer-generated environment. Narrative is about the actions of people, about their relations to other people and to their environment, but not every sequence of actions and events constitutes a well-formed narrative. As Aristotle observed in the *Poetics* (paragraph 5.1), stories must have a beginning, middle, and end; they must represent some kind of conflict that comes to a resolution. In regular stories, the author has complete control over the plot, but in interactive stories the plot must emerge from the interaction between the user and the computer. This means that the story must be partly generated by the user and partly by artificial intelligence. A lot of effort has been devoted since the year 2000 to develop a so-called “narrative intelligence” (Mateas & Sengers 2003), but the results have been meager. I do not know of any computer-generated narrative worth reading for its own merit.

As I argue in *Narrative as Virtual Reality 2. Revisiting Immersion and Interactivity in Literature and Electronic Media* (Ryan 2015), if computers still cannot generate entertaining, non-interactive stories when the machine has total control over the storyworld, the difficulty of the task is taken to a much higher power when the story must integrate the unpredictable input of the user. In the Holodeck, for whatever the user says or does, the computer must understand the action of the user, respond in an appropriate way, and steer the storyworld toward an appropriate ending that brings narrative pleasure to the human participant. The dynamic generation of interactive stories is not the kind of problem that could be solved in the future by a more advanced AI, because it is not a technological but a logical problem. The AI researchers Ruth Aylett and Sandy Louchard describe this problem as “the interactive paradox”:

On one hand the author (in this case the computer) seeks control over the direction of narrative in order to give it a satisfactory structure. On the other hand a participating user demands the autonomy to act and react without explicit authorial constraint (2004: 25).

There is no solution to the paradox but only acceptable compromises: either restrict the freedom of the user in order to create a coherent narrative; or expand the freedom of the user and sacrifice narrative form.

As the year 2000 neared by, it became evident that neither the vision of VR developers nor the Holodeck narrative were going to materialize anytime soon. Jaron Lanier, one of the pioneers of VR, told an interviewer:

As for the waning of virtual reality from public attention, I bear some of the blame for it. I always talked about virtual reality in its ultimate implementation

and when that didn't happen, interest declined. Because everyone wanted the Holodeck from *Star Trek*, virtual reality could not fulfill its promise so quickly (Ditlea 1998).

After 2000, VR continued to be developed in the scientific sectors, and it found a number of practical applications (Slater & Sanchez-Vives 2016). But the public expected new forms of entertainment, and when they did not materialize, VR disappeared from the radar of the media.

The two poles of digital entertainment

Instead of *Hamlet* on the Holodeck, we got two types of digital entertainment. At one pole is the esoteric domain of electronic literature, represented by hypertext fiction as well as by three collections of texts on the Internet gathered by the Electronic Literature Association. Hypertext fiction enjoyed for a while a cult following in academia, and it was touted as the future of the novel, but it never caught up with the general public, because by breaking up stories into fragments, and by giving the reader a choice of links to follow, it implemented interactivity at the cost of immersion. Far from turning readers into creative co-authors, as its early advocates claimed (Bolter 1991; Landow 1997), hypertext deprived them of such basic narrative effects as surprise and suspense (Sternberg 1992), which depend on a precise authorial control of the release of information. Such control is impossible when readers can choose multiple paths through a network of interconnected fragments. As for the texts gathered in the ELO collections, most of them are dominated by a "textualist" aesthetics, inherited from postmodernism and deconstruction, which locates aesthetic value in self-reflexivity and attention to the medium rather than in world construction. These texts make the computer visible through the exploitation of dysfunctionality, such as deliberate glitches, vanishing inscriptions, nonsense generation, pointless interaction, parodies of digital tools, and heterogeneous collages of data randomly fished from the Internet (Emerson 2014; Ryan 2015). As a general rule, electronic literature endorses the interactive dimension of VR, but it rejects its immersive ideal because the precondition of immersion is the disappearance of the computer. Yet, according to VR researchers Mel Slater and Maria Sanchez-Vives, illusion in VR is never total. They argue that users only experience presence when they remain aware that the object of their perception is a computer-generated image. In real life, we take the presence of the environment that surrounds us for granted and we do not reflect on it; in VR, by contrast, the experience of presence should become a cause of wonder and a source of

potential pleasure. It is paradoxically the awareness that the environment is computer-generated that makes participants notice and appreciate the disappearance of the computer.

At the other pole of digital entertainment is the wildly popular genre of computer games. Judging by their addictive nature, these games fulfill the VR ideal of an “immersive, interactive experience generated by a computer” (Pimentel & Teixeira 1993: 11). While in hypertext fiction interactivity came at the cost of immersion, in games interactivity has an immersive effect, since players are consumed by the desire to solve problems. The immersivity of computer games comes not only from the agency given to the players and from the desire to beat the game or other players. It also comes from the construction of sensorially rich game worlds, which players can explore and where they feel at home. In contrast to traditional board games or sports games, such as chess or football, computer games do not place players in an abstract space but in a concrete environment full of recognizable objects and characters. The tasks given to the players are not actions that receive meaning only by the rules of the game, such as kicking a ball into a net, but rather they are inherently meaningful and beneficial actions, such as killing dragons, rescuing princesses, or escaping enemies. There are few princesses and no dragons in the real world, but if dragons existed, and if the situation presented itself, surely most people would jump at the opportunity to save a beautiful and rich princess from an evil dragon? This concrete, representational dimension creates a connection between computer games and narrative, for if games construct worlds, and if players can perform actions that change the state of these worlds, there must be some kind of story that unfolds in the game world, thanks to the player’s activity.

But even though they are both interactive and immersive, computer games are not the Holodeck, because they subordinate narrative to gameplay, and as a result, their underlying narratives are not the focus of attention but a means toward a goal – the goal of motivating a player to play. This subordination to gameplay explains why there is not much variety in game narratives, compared to the amazing diversity of book or film narratives. The most common narrative pattern in computer games is an adaptation of the archetype of the hero’s journey, as defined by Joseph Campbell (2008), Vladimir Propp (2018), and others: a solitary hero accepts a mission, goes on an adventure, passes a number of tests, and returns home victorious (or sometimes defeated, as may be the case in computer games). Standard game narratives follow pre-defined scripts that force players to pass through the same sequence of checkpoints, but every player creates variations on the fixed pattern, since no two players will perform the exact same actions. Branching structures can produce different stories, especially stories with different end-

ings, but even though the player's actions determine how the story will end, the various possible endings are built into the system rather than created on the fly.

With electronic literature and shooter-type computer games, digital entertainment has reached the two poles of the cultural spectrum – the pole of experimental, avant-garde literary forms, frequented by a rarefied, mostly academic public; and the pole of popular culture, frequented by the masses. But between these two zones, which I have called the North Pole and the Tropics (Ryan 2007), lies a third area, which I call the Temperate Zone, and which is frequented by an educated but critical public, a public that desires neither the deconstruction of narrative, nor its reduction to stereotyped forms and its subordination to gameplay. All significant narrative media have conquered the Temperate Zone, but this conquest has been particularly problematic for digital technology. Independent games have been working to fill this gap, especially through the development of a game genre known as environmental storytelling, and represented by such games as *Dear Esther* or *What Remains of Edith Finch*. This genre follows a pattern that I call epistemological, the pattern of the detective story. The player explores a computer-simulated world and uncovers a story that took place in this world, often by finding tell-tale objects such as letters and diaries, or simply by listening to voices that narrate past events when the player reaches certain locations in the game world. The pleasure of these games is not meant to lie in an original or exciting gameplay – the player's activity is limited to moving through the game world and looking at objects – but in curiosity for the story, in the satisfaction of extracting it from the environment, and above all in the visual appeal of the game world.

Yet, in a polemical article titled “Video Games are Better Without Stories”, the prominent game theorist and game developer Ian Bogost questions the value of the narrative experience provided by environmental games. He argues that the story told in *What Remains of Edith Finch* would be better served by making it into a movie or telling it in a novel. And indeed, if a story truly captivates the reader, the effort needed to discover it by finding a way to progress through the gameworld may be more annoying than gratifying. Movement through the gameworld is restricted by an invisible code, and the player must find the proper paths or points of access to uncover new information. But while the game genre of environmental storytelling may frustrate people who play for the plot exclusively, I cannot agree with Bogost that video games are better without stories. As already mentioned, these games owe much of their success to their ability to give narrative meaning to the player's actions; without narrative structure, we would still be playing Tetris or tic-tac-toe. On the other hand, I tend to agree with Bogost that game

stories have not reached the artistic heights and diversity of the best novels, dramas, and films, and possibly never will. But even if their narrative potential does not rival that of novels or film, computer games still have much to gain by trying to realize this potential.

The rebirth of the VR dream

The three genres I have discussed so far – electronic literature, standard games focused on gameplay, and independent games focused on the discovery of a story – were pretty much the state of the art of digital textuality in the mid two thousand tens. But then VR made a surprising come-back. The trigger to its rebirth was the development of new hardware to replace the clumsy, heavy equipment of the 90s. In 2014, Mark Zuckerberg, the founder and CEO of Facebook, purchased Oculus Rift, the maker of a relatively cheap and lightweight HMD (head-mounted display), for two billion dollars. The supposedly imminent second coming of VR spurred renewed talk about the narrative potential of the medium. But where are the applications, where is the content?

In the remainder of this article, I propose to discuss some of the existing narrative applications of VR in order to assess the storytelling potential of the medium. But as a preliminary, it will be necessary to return to the experience of immersion.

Types of immersion

Immersion can be conceived in two ways: as a technological effect or as a mental state. The two cannot be totally dissociated, since the immersivity of a technology is always a measure of its ability to induce immersion as a mental state. In VR interactivity leads to immersion because it connects the user to the environment. But immersion is also pursued by means of two visual features: a 3D representation; and a panoramic, 360 degree image of a virtual world. These two properties can be implemented separately: for instance, a non-interactive 3D image is found in film or in the old-fashioned technology of the viewmaster, while an interactive, 360 degree representation of a world is found in many screen-based computer games, though without presenting 3D effects. While 3D representation can be passive, as film demonstrates, 360 degree representation is always interactive, for without the ability to look around and to alter the field of vision the user will not appreciate the panoramic nature of the display. The

total angle can be less than 360 degrees, but the display remains interactive as long as it allows some freedom to look around.

As a mental state, immersion can be divided into several categories. First, there is ludic immersion – the passion a player brings to playing a game, solving problems, and beating opponents. This type of immersion presupposes an interactive environment and is independent of any kind of concrete world and narrative content; it is experienced by chess and bridge players as intensely as by players of computer games such as *Word of Warcraft* or *Grand Theft Auto*.

Then there is what I will call mimetic immersion, or narrative immersion, which is a response to the concrete representation of a world that evolves in time. This type of immersion can be provided by a variety of media: by a literary narrative, by film and TV, by drama, and by narrative computer games. It comes in several varieties (Ryan 2015):

Spatial immersion: a sense of place, of connection to the environment. In a computer game it can also be a strategic appreciation of the configuration of space and of how this configuration can be used to reach one's goals. Or it can be the pure joy of being able to move through space, of exploring it and discovering ever new regions.

Temporal immersion: an experience that can also be called narrative tension. It resides in the burning desire to find out what happens next, and it covers the three fundamental narrative experiences of suspense, curiosity, and surprise. In an interactive environment temporal immersion can also result from the sense that you have only a limited time to perform certain actions, as for instance when you must kill your enemy before he kills you.

Emotional immersion: the main form of emotional immersion is empathy, which is an emotion directed at others, such as feeling vicariously happy when good things happen to people or characters you like and sad when bad things happen to them. But as tragedy demonstrates, emotional participation in the sad fate of characters is not deep enough to prevent aesthetic pleasure. In computer games emotions can also be directed at oneself, such as feeling excited, frustrated, dejected, or elated, depending on one's success.

In real life we find all four kinds of immersion, though the concept of ludic immersion must be extended to cover not only the playing of games but also absorption in useful tasks. In virtual life, as I will call the experience provided by all kinds of representations, different media provide different kinds of immersion, and we can use the four kinds described above as a criterion for comparing the expressive potential of narrative media (Table 1).

	Spatial	Temporal	Emotional	Ludic (interactivity)
Written narrative	High	High	High	None
Film	High	High	High	None
Theater	Low	High	High	None
Music	None or low	High	High	None
Video games	High	High	Low	High
VR	High	Low	Medium to High	Medium

Table 1
Types of immersion in various media

This assignment of values describes general affordances rather than rigidly distinctive features, and it does not prevent individual texts from challenging the limitations of their medium.

Written narratives score high with respect to the three mimetic kinds: they can provide spatial immersion through the description of places; they provide temporal immersion through suspense, curiosity, and surprise; and they can bring readers to tears over the fate of characters. But since they are not interactive, they scores zero on ludic immersion.

Movies can achieve the same types of immersion as written narrative: high on spatial, temporal, and emotional (even higher in this respect than written narratives: crying is much more frequent when watching films than when reading books); but no ludic immersion.

Theater is high on emotional and temporal immersion, but it scores lower than movies and written narrative on spatial immersion. This is for two reasons: the phenomenon of the fourth wall separates the spectators from the stage; and the fact that the spatial point of view cannot be changed reduces the setting to a largely static image. In film, by contrast, the camera can move, and in written narrative the narrator can alter the perspective from which scenes are described.

Music, though not representational, is the strongest medium in terms of emotional and temporal immersion, but it scores low on spatial (I am thinking of stereophonic effects) and null on ludic – unless one takes into consideration the performer’s experience.

Standard video games are by definition strong on ludic, and they score high on both kinds of spatial immersion: sense of place and strategic. On emotional immersion we have a hung jury. As noted above, games inspire self-directed emotions, which depends on the player's success. Players may also develop strong affective relations to their avatar in games such as *Second Life*, where they create their avatar, or in games whose purpose is to take care of a virtual creature such as a pet or a baby. But these games do not follow the standard script of defeating enemies in order to fulfill quests, and in the case of *Second Life* the player's emotions for the avatar can be regarded as self-directed. The kind of emotional immersion that is directed at characters is more problematic, at least in standard competitive games, because non-playing characters are generally seen not as persons but as obstacles to the achievement of the player's mission or as providers of help. In one case they must be eliminated, in the other they only matter because of the useful objects or information they can give to the player. When gamers rescue princesses, they are not motivated by love, as are the heroes of romances, but only by the desire to progress in the game. Much effort has been recently devoted by game designers to involve players in emotion-rich situations, for instance by creating moral dilemmas: should I kill this character who has helped me before or sacrifice these innocent civilians in order to save my life? But emotional involvement conflicts with the pursuit of game goals: if the player chooses the more ethical option, it may put the continuation of the game in jeopardy.

What kinds of narratives will the affordances of VR produce, and how will they perform with respect to the four forms of immersion? There is no doubt that a 3D, 360 degree representation of an environment will enhance video games by intensifying spatial immersion. One of the available applications for the Oculus Rift is a climbing game (*The Climb*; Crytek 2016) that allows players to scale rock walls without fear of heights nor risk of getting hurt, and that lets them choose the setting (the canyon, the Alps, and the bay). But adding VR effects to computer games does not require a rethinking of the role and form of narrative; what worked for standard screen-based games will work even better for VR games, and the same pre-scripted narrative archetypes (or stereotypes) can be used in both cases. We can safely say that most of the games that work on a screen will work equally well, if not better, with the visual effects of VR technology. But here I am interested in the medium-specific narrative applications that fill the void of the Temperate Zone.

I will restrict my discussion to applications that actually exist, rather than trying to imagine VR in its ultimate form. This means that we must give up on the most distinctive property of the Holodeck, namely the gener-

ation of narratives in real time. All the examples I will discuss are based on a pre-scripted scenario and pre-recorded data. What makes them VR is the two properties I have already mentioned: 3D images and interactive panoramic representation. 3-dimensionality cannot be experienced on a regular computer screen but interactive panoramic representation can. It is therefore possible to get an idea of what is being promoted as VR narrative by watching flattened examples on the Internet, especially on YouTube.

VR as panoramic representation

A panoramic representation of a storyworld means that a lot of data must be generated that the user will probably not see. In everyday life we do not look around all the time; rather, we focus our attention on certain points of interest (POI, in the jargon) (Tricart 2018). In a narrative film the camera does it for us: it shows where the action is, which means that it follows the characters. It would make no sense for the camera to show the ceiling when the hero and heroine are kissing, or if it does, it is a calculated effect on the part of the director. In a VR system with panoramic representation there is no director who decides what the user should see; the user can look around all the time, but if the system relies on a strong narrative script, the user will focus on the POIs, and most of the data will be wasted. Alternatively, if the user decides to take full advantage of the opportunity to look around, he may get the feeling of missing out on what is important to the plot, because as he takes time to explore, narrative time keeps moving forward, and something important may be happening where he is not looking. The art of VR narration thus requires a compromise between the user's instinctive tendency to focus on the heart of the narrative action and his desire to exercise his agency by exploring the scene. Or, to put this differently, the art of VR narrative must find the right balance between temporal immersion, which relies on interest in the evolution of the storyworld, and spatial immersion, which relies on interest in the environment.

One way to avoid the conflict of time versus space is to turn the spatial environment itself into the center of interest, so that the user will find something worthy of attention in all directions. A case in point is *Clouds Over Sidra* (Arora & Milk 2015), a 6 minute documentary about a camp for Syrian refugees in Jordan. The purpose of this film is to show the living conditions of the refugees, the boredom, the hopelessness, but also the determination to prepare for a future life of freedom. For the boys, this determination consists of getting physically fit for the return to Syria or of engaging vicariously in freedom fights through computer games; for the girls, more specifically for

the heroine, it consists of making the most of their time in the camp by being good students. Gender divisions remain strong: the boys will not let the girls play computer games or exercise in the gym, while the classroom seems to consist exclusively of girls. But there is one small exception to the traditional gender roles: the girls are allowed to play football, which they could not do in Syria. Through this scene, the film subtly points to a future when women will have more opportunities open to them.

The film consists of several distinct scenes, each focused on a specific place: the desert, the classroom, the living quarters of individual families, etc. The user can manipulate the camera, scroll left or right, up or down, and explore the entire scene. There is no doubt that the images are documentary but the status of the narrator is more questionable. She is presented as a twelve-year old girl named Sidra, and she speaks in fluent English though with a marked accent which is supposed to give authenticity to her testimony – a technique commonly used in voice-over of foreign speakers in television news. But where does the text come from: is it an adaptation of what Sidra may have told orally to an interviewer, or was it written by a scriptwriter who imagines what it is like to be Sidra? The perfect coordination between the images and the narration suggests this second solution. But most spectators will regard the narration as the authentic voice of Sidra. By giving an identity to the narrator, even if this identity is not genuine but acted out, the film strengthens its emotional impact, because we are more inclined to be affected by the experience of one particular individual than by the experiences of thousands of anonymous people.

Through its focus on the living conditions of Syrian refugees, the film foregrounds spatial environment at the expense of time and description at the expense of narration. There are suggestions of the past and of the future that bring changes – the crossing of the desert to reach the camp and the anticipated return to Syria – but between these two events time is suspended, and life is an endless repetition of daily occupations. This lack of eventfulness, which also means a lack of narrative action, means that the various scenes have no outstanding points of interest beyond the space itself where they take place. The user does not risk missing something important when exploring the setting.

My next example contrasts with Sidra on two points: it is a fiction, not a documentary; and it relies on parallel events which cannot be seen at the same time; it is therefore necessary to replay the movie to get a more complete understanding of the action. This example, titled *Hard World for Small Things*, was commissioned by the VR firm WeVR to filmmaker Janicza Bravo (2016). *Hard World* focuses on a dramatic, literally life-changing event, rather than on a static, ongoing situation. This event is a fictionalized version

of the kind of incident that inspired the Black Lives Matter movement: the shooting of an unarmed black man by white policemen.

The film begins by showing two black men and a Hispanic woman driving through Los Angeles in a convertible, engaging in small talk and obviously enjoying themselves. The dialogue sounds very natural and seems to be at least partly improvised by the actors. By manipulating the controls, we can get an idea of the kind of neighborhood they are driving through. After a while, the people in the car notice two women they know standing on the sidewalk. They park their car in front of a store, and the male passenger gets out and starts talking to the two women while the driver and the woman passenger remain in the car. At this point there are two conversations going on simultaneously. You can hear them both, but when you focus on one conversation, the other becomes background noise and cannot be clearly followed. A new line of action develops when the driver leaves the car to assist an old woman who is crossing the street, and brings her into the car, promising to take her home. Meanwhile, the female passenger has started talking on her cell phone, adding a third conversation. Depending on where you are looking, you may or may not notice that the male passenger leaves the two women on the sidewalk and enters the store. But then something happens that you will not miss, even if you are looking elsewhere, because it immediately attracts everybody's attention and interrupts all the other conversations. Two white men walk toward the car, tell the driver extremely rudely to turn down the music on the radio, and ask him how he got the car: did he buy it or was it given to him? These two men are obviously cops, even though they are wearing civilian clothes. So far the action has been presented in one continuous shot. Then a cut occurs, and we are inside the store. From that moment on things happen very quickly. The point of view depends on what you have been looking at before, and you do not have time to change it. If you have been looking at the cops, you will still be looking at them once you are inside the store; you will see one of them pull a handgun and shoot; you will hear the victim fall down and moan as he is dying. But at first sight you do not really know who he is and why he was shot, though you may guess that he is the man in the car, because this assumption gives more coherence to the plot. If you have been looking at the people in the car, you will be looking at the victim after the cut. You will see that after he pays for his purchase, he accidentally bumps into one of the cops, and this collision, which is interpreted as aggression, is what motivates the other cop to shoot. If you want to play detective, you can even select a point of view and move in slow motion, shot by shot, to reconstitute the event.

The idea of presenting an event from several different points of view has been made famous by the 1950 film *Rashomon* by Akira Kurosawa, where various characters provide subjective and self-serving versions of an apparent

murder in order to demonstrate their innocence. But the several versions are still controlled by the director. Here it is the spectator who controls the point of view, but the various possible perspectives correspond to objective locations within the storyworld and not to subjective motivations. By manipulating the point of view, we get a better idea of what happened, but not of why it happened. For the task of representing subjective motivations and explanations movies and novels remain better media.

Another limitation of this film (and of the preceding example) resides in its reliance on camera-produced images that are stitched together. Every camera shot is taken from a certain distance, and the user cannot change it. We can move right or left, up or down in the storyworld (though the up movement is rarely interesting), but we cannot get closer to objects in order to inspect them in greater detail, nor can we pick up and manipulate objects. Such operations are common in computer games, because these games rely on computer-generated graphics rather than on filmed data (except in the non-interactive cut scenes). Slater and Sanchez-Vives have argued that only systems based on computer-generated graphics are truly VR. According to their view, the examples I have discussed are nothing more than a new kind of film technique.

VR as an experience of embodiment

One of the strengths of VR systems based on computer-generated graphics is their ability to manipulate our experience of our own body. The film *Avatar* (Cameron 2009) is a case in point. The hero is a disabled soldier confined to a wheelchair, but when he enters the planet Pandora as an avatar created by VR he has full control over his virtual body. By manipulating the brain's image of the body, VR is able to lead to new experiences of embodiment. It can create an out of body experience by projecting to the user an image of its own body; it can allow users to see themselves from the back; and it can place them in entirely different bodies: for instance into a black body if you are white, a disabled body if you are healthy, and a healthy body if you are disabled. One of the first attempts to use VR for an artistic purpose was an electronic art installation named *Placeholder*, created around 1994 by Brenda Laurel and her team. *Placeholder* was never fully implemented, and even the parts that were realized fell far short of the creator's vision, but the idea was to make the participant re-discover the world through the body of a mythical creature inspired by Native American myths. If you were Crow, you would have enhanced vision; if you were Spider, you would have eight eyes capturing eight different points of view; if you were Snake, you could see in the dark; and if you were Fish, you could see underwater.

One recent project that explores this ability of VR to provide alternative experiences of embodiment is an installation sponsored by the Goethe Institut in Prague (2018) based on Franz Kafka's story *The Metamorphosis*. It is called *VRwandlung*, a pun that blends the German title of Kafka's story (*Die Verwandlung*) with the VR initials. The project puts the user in the situation of Gregor Samsa, who wakes up one day to discover that he has been transformed into a giant insect. A major theme in Kafka's story is Gregor's progressive acquaintance with his new body, how he uses it to move around his room, and how space is reconfigured to fulfill the needs of an insect body. For instance, Gregor can now hide under the bed to spare his mother the awful sight of his body, and he can crawl on the walls to entertain himself. Thanks to VR's ability to place users into a virtual body, which they can activate through the movements of their physical body, Kafka's story is uniquely suited to the affordances of the medium. The user should be able to experience what it feels like to control a body with six legs and giant antennae that impede his movements. He will be able to explore the room. And if he moves in front of the mirror, he will also discover his new body from a third person perspective. There is no mirror in Kafka's story, and Gregor only sees his body from a first person perspective, but this departure from the text intensifies the user's experience of discovering his new body. But one thing the installation cannot do is to recreate the plot of the story in its entirety, the way a text or a movie could. If the user who plays Gregor is going to have some agency, he cannot be forced by the system to behave exactly as Gregor in Kafka's story does. *VRwandlung* should not be considered a retelling of Kafka's story but rather an illustration. Just as the pictures in a storybook propose visual interpretations of some aspects of the story they illustrate, but without capturing the whole plot, so does the VR adaptation of Kafka's story: it may deepen the experience of people who already know the story, but it cannot replace the text.

VR as immersive experience

How does VR narrative score with the four types of immersion that I have defined? Based on the very limited corpus I have examined, I rate the technology as follows (see last row of Table 1):

MEDIUM on ludic immersion. All three projects allow a mild degree of user agency, but this agency does not affect the plot, and it does not compare to the Holodeck or to standard computer games.

HIGH on spatial immersion. All three projects foreground the experience and exploration of space.

LOW on temporal immersion. Neither *Sidra* nor *VRwandlung* can sustain a plot that develops in time; and in *Hard World* it is necessary to replay the movie several times and to alter the perspective to fully understand what is going on.

MEDIUM to HIGH on emotional immersion. All three examples create empathy for the characters by giving the participant a sense of what it is like to live under certain conditions, though for the first two examples this seems to be due more to the subject matter than to the technology. It is only in the Kafka example that the technology allows participants to identify with a character. By default, I give a MEDIUM to HIGH on emotional immersion.

All three examples are very short (about 6 minutes). To be commercially viable, a VR narrative would need larger time frames. But could the user's interest in active participation be maintained any longer? In computer games based on competition and problem-solving, people play for hours at a time, but they are driven by the desire to achieve specific goals, a motivation which does not come into play in these examples.

One possibility would be to create a large world that can be explored in short sessions, the way large novels can be read. The film *Russian Ark* (Sokurov 2002) provides an example of how this could be done. Shot in one continuous camera take, the film shows 33 rooms of the Winter Palace in Saint Petersburg, focusing on various scenes before moving to another room and to another scene. The ballroom, site of fleeting group formations, social interactions, and amorous encounters, is a particularly good example of the kind of parallel action that justifies 360 degree film technology. In a VR adaptation, if 360 degree representation can be called VR, the spectator would freely move around the rooms and select which people to follow and which conversations to overhear. Would this freedom improve on the original *Russian Ark*, or would the spectator quickly tire of it? It all depends on whether or not the partial information gathered by the user could be fitted into a larger, meaningful whole.

Conclusion: the storytelling potential of VR

In October 2017, Mark Zuckerberg announced the goal of getting “one billion users in virtual reality” – a goal that seemed disproportionate with the sales of the Oculus Rift HMD, which reached only about one million in the summer of 2017. It is certainly not with narrative applications, such as the ones I have described, that Zuckerberg hopes to reach that number, but rather with presence effects that connect users to remote people and venues such

as the sites of rock concerts and sports events. VR has a great potential for tourism: it will allow people to visit exotic landscape and to explore famous monuments without leaving the comfort of their home. There is also the always powerful lure of pornography. A bad omen for the future of narrative in VR was the announcement, in May 2017, that Facebook was shutting down the Oculus story studio, despite producing two award-winning 360 degree films, *Dear Angelica* (Unsel 2017) and *Henry* (Dau 2015).

Measured against the technological overhead they require, the narrative examples I have discussed remind us of the mountain that gave birth to a mouse. Could it be that the vocation of VR as a medium of entertainment does not lie in storytelling? It all depends on whether we understand storytelling and narrative in a broad sense, as these terms are used in mass media, or in the narrow sense endorsed by narratology, according to which narratives represent a sequence of events involving human or human-like characters and following a pattern of conflict and resolution. In this conception narrativity is a matter of plot

In 1996, Monika Fludernik proposed a different definition of narrativity, a cognitive definition based on what she calls experientiality. For Fludernik, what makes a medium artifact a story is that it gives its audience a sense of “what it is like” to experience a certain situation. I find this view a little too broad, because there are many artworks that capture human experience without telling stories – for instance music, lyric poetry, and certain kinds of paintings. But the conception of narrative as a representation of experience describes very well the examples I have presented. All of them give the user a sense of “what it is like” – what it is like to be a refugee in a camp; what it is like to have a carefree outing with friends interrupted by a senseless shooting; what it is like to have the body of an insect. Experiencing a situation or an environment does not, however, require a narrative in the plot-based sense of the term. The strength of VR as a medium of entertainment is not to tell the story of Hamlet or of Little Red Riding Hood, but to take us to mountaintops and under the sea, to let us fly or walk on the moon, and to give us new bodies. Forget the storytellers: there are good reasons why VR developers prefer to call their projects “experiences” rather than narratives (Marantz 2016: 88).

I will conclude with two quotes. The first is from a TED talk by Anthony Geffen on YouTube promoting this “amazing new medium”:

VR has a huge potential in terms of being a storytelling medium... We have the technology, but it's the story that's going to drive this medium. Let the storytellers push this medium. This is without doubt a step in human evolution... Let the storytellers take up the opportunity in what I think will be a very [inaudible M-R.L.] medium (Geffen 2019).

Who are those storytellers who are going to drive the medium? It could be that by storytelling Geffen means simply “content providing” – any type of content. Alternatively, if we take storytelling as meaning “providing narrative content”, then a parallel could be drawn between the current state of VR and the early days of cinema: when film was first invented by the brothers Lumière, it was mainly used to record theater, and it took a while for filmmakers to understand how to narrate in this new medium. The same could happen with VR, we just need to be patient. This is one possible interpretation of the modesty of the current achievements of VR narratives. But according to another interpretation, the distinctive affordances of VR are not necessarily good at telling stories. As a commentator who goes by the name Cannibal Kid responds to Geffen’s talk:

I’m not sure, if ‘storytelling’ will work properly in this medium. To me, the most astonishing VR-experiments are more ‘experiences’ to me. There is nothing wrong with that, and it works fine. But I kinda want to see what is beneath the craze of “oh my god I’m in a submarine” or: “Dude, I’m standing on Mt. Everest”. Will games with a complex story work? Or will they make gaming just more attractive to the “non-gamers”, because of this new technology? It’s gonna be interesting (Cannibal Kid 2019).

As a narratologist, I sincerely wish that the first quote were the right one, and that the storytellers someday will make VR into a major narrative medium, on par with literature, film, comics, and TV. But my sense of the nature of narrative aligns me with the second.

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